Course Essentials: Communication, Content, and Structure

Communication

Office: HN 1090J

Office Hours: Tuesdays and Fridays, 9:45 - 10:45 A.M., or by appointment

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Resources

Textbook: *Introduction to Computer Theory*, 2nd Edition. Daniel Cohen. John Wiley & Sons, New York. 1996. ISBN-13: 978-0471137726 .

On-line Material: This page and all documents related to this course are available for download on the CUNY Blackboard. In addition, I will be posting material on my website in the home page for this class.

Course Content and Objectives

The title of this course is Computer Theory. Daniel Cohen explains in Chapter One of the textbook why he has chosen this instead of the more traditional names, Theory of Computation and Computability Theory, but this course is mostly concerned with the relationships between formal languages and the abstract machines that can recognize them. It is pure theory, in any case, and it shall move along by a sequence of definitions, theorems, and their proofs. The theory has practical implications in terms of the construction of compilers and their parts, and the design of programs in general, but the practical consequences are not the subject of the course. There is little math in the traditional sense, but the course is mathematical in that it uses the same methods of deduction and logical consequence to prove ideas about languages and machines as would be used to prove theorems about numbers or geometry, for example.

If you are wondering why the Computer Science Department requires you to take this course, it is because it is fundamental to the very nature of computers. Unfortunately, it is CSci 365 that delivers the most important punchlines, not CSci 265, but in CSci 265 the groundwork is partly laid for those revelations. I have several objectives in this course. One is to try to make you see the beauty in the theory itself. Another is to give you a deep understanding of the basic concepts of formal languages and finite automata. Last is to train you to construct and recognize proper proofs.

Prerequisites

You are required to complete each of CSCI 245 and Math 150 with a grade of C or better prior to taking this course. If you have not done this, you will be dropped from the course during the first week of the semester.

Passing This Course

If you do not want to repeat this course then you should do *all* of the following:

- Read the assigned reading ***before*** the lecture, *not after* it.
- Make a list of questions and ask them. If a question is not appropriate for the class, I will answer it at another time. I will be the judge of what is appropriate for me to answer during class time.
- Submit all assignments on time.
- Study for exams.
- Do your assignments yourself.

Syllabus and Readings

Which parts of the textbook and when they will be covered is described in the document entitled ***Syllabus*** on the course website. You are responsible for everything in the listed chapters regardless of how much time we spend on them in class. As noted above, you should read ahead so that you can ask questions in class to clear up anything you find confusing.

Academic Honesty Policy

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. In this class, I will enforce the University's Policy on Academic Integrity and bring any violations that I discover to the attention of the Dean of Students' Office.

Grading, Exams, and Assignments

Your grade is computed strictly from two components: your graded homework scores and your exam scores. The homework component is 36% of your grade and the exam component is 64%. Homework assignments will be given every week, and they will be due the following week, except on weeks prior to an exam. Homeworks will have equal weight, unless stated otherwise.

Exams

There will be two midterm and one final exam. The final exam is NOT COMPREHENSIVE; it covers only the material in the last third of the course. The schedule, including weights of exams towards the final grade is below.

Exam	**Weight**	**Date and Time**
Exam 1	20%	Friday, February 29
Exam 2	20%	Friday, April 4
Final Exam	24%	Tuesday, May 20, 9:00 - 11:00 A.M.

Make-up Policy, and Incomplete Grades

All exams must be taken at the scheduled time. Failure to take an exam counts as a zero grade on that exam. The only exception is if you miss a midterm exam for a serious, documented medical illness; in that case I will schedule an alternative exam. Note the word "serious" in the preceding sentence. If you miss two or more exams for medical reasons, you should seek an official withdrawal and retake the course. I do not give out incomplete (IN) grades except for those students who have been completing all work on time and who, for legitimate, documented medical or personal reasons, miss the final exam.

Syllabus

The course will cover Chapters 1 through 18 of the textbook. We will cover about three chapters every four class meetings, but certain chapters will take less time than others. The chapter topics, in order, are:

1. Background
2. Languages
3. Recursive Definitions
4. Regular Expressions
5. Finite Automata
6. Transition Graphs
7. Kleene's Theorem
8. Nondeterminism
9. Finite Automata with Output
10. Regular Languages
11. Non-regular Languages
12. Decidability
13. Context-Free Grammars
14. Trees
15. Regular Grammars
16. Chomsky Normal Form
17. Pushdown Automata
18. "CFG = PDA"

Sometimes, I will cover material not in the textbook, in which case I will make notes available to you.